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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/731,559	12/09/2003	Ansheng Liu	42P18076	5092

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EXAMINER	
WONG, TINA MEI SENG	
ART UNIT	**PAPER NUMBER**
2874	

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/731,559	LIU ET AL.	
	Examiner	Art Unit	
	Tina M. Wong	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office action is responsive to applicant's communication submitted on 23 November 2005. The Examiner notes the corrections of the minor informalities to the Specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,437,372 to Geva et al in view of U.S. Patent 6,895,134 to Glogovsky et al.

In regards to claims 1, 3, 7, 8, 9, 11-17, 19-20, 24, and 25, Geva et al discloses an active region (302, 303, 304) disposed in a semiconductor material (301) including a p-doped region (304) and an n-doped region (302). Geva et al further discloses an insulating region (305) disposed in the semiconductor layer in the active region.. Geva et al also discloses an optical beam to be directed though the active region (Figure 3), but Geva et al fails to explicitly state that a phase shift occurs in response to a modulated charge region in the active region. However, when a signal is modulated and sent through the active region, the change in the input will cause a phase shift to occur. Furthermore, it has been held that the functional "wherein" statement does not define any structure and accordingly cannot serve to distinguish. Additionally, although Geva et al does not explicitly state that the insulating region electrically isolates the active region from the passive region, Geva et al discloses the insulating layer to reduce leakage current and

enable current confinement. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art that the insulating region does electrically isolate the active region from the passive region since Geva et al discloses the isolating region to control the current leakage. Furthermore, Geva et al fails to explicitly state that the insulating layer to surrounds the active region. However, it would be desirable to prevent the unintentional doping or altering of the active region in order to prevent a shift in the wavelength or signal. Therefore, in order to prevent a shift in the wavelength, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have an insulating layer surrounding the active region. Lastly, Geva et al fails to specifically disclose a passive portion of the optical waveguide. However, Geva et al discloses the PIN structure to be used in optoelectronic devices. Glogovsky et al also discloses an optoelectronic device with a PIN structure (31, 32, 33) formed on a semiconductor layer. Glogovsky et al further discloses a passive region of the waveguide disposed in the semiconductor layer, where an optical beam is directed through the passive waveguide to the active region. Since both Geva et al and Glogovsky et al both disclose optoelectronic devices using PIN structures, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have included a passive portion of an optical waveguide in the optoelectronic devices in order to obtain a more efficient optimization of two active devices.

In regards to claims 2, 18 and 21, Geva et al discloses an intrinsic region (303) adjoining and disposed between the p-doped and n-doped region.

In regards to claims 4 and 22, Geva et al discloses an insulating region adjoining the p-doped and n-doped region.

In regards to claims 5 and 23, Geva et al discloses substantially none of the intrinsic region disposed between the insulating region and the p-doped and n-doped region.

In regards to claim 6, Geva et al discloses a p-i-n diode structure in the active region.

In regards to claim 10, Geva fails to disclose the insulating region to comprise one of silicone nitride, oxide, silicon dioxide or air. However, Geva et al discloses the refractive index of the insulating layer needs to be lower than the refractive index of the active layer. Since the refractive indexes of the claimed materials have a value less than the refractive index of the active layer (InP) disclosed by Geva et al and these materials are commonly used for insulating regions, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to use one of the materials as claimed by Applicant.

In regards to claims 26-30, Geva et al fails to disclose an optical splitter or a plurality of waveguides connected to the system. However, Geva et al discloses a variety of devices the semiconductor element can be connected to or be a part of, such as a modulator, laser, photodetectors and other optoelectronic devices. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have connected the system to an optical splitter or a plurality of waveguides in order to couple the system with the suggested devices.

Response to Arguments

Applicant's arguments with respect to claims 1-30 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tina M. Wong whose telephone number is (571) 272-2352. The examiner can normally be reached on Monday-Friday 8:30-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rodney Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TMW

MICHELLE CONNELLY-CUSHWA
PRIMARY EXAMINER

1/23/04